06/14/07

M E M O R A N D U M

TO: Steve Ogle, P.E., Technical 1 Engineer
Boise Regional Office

FROM: Xin Dai, Environmental Scientist
Environmental Resources Discipline, Technical Services

SUBJECT: Staff Analysis for the Draft Permit LA-000037-03, City of Mountain Home, Municipal Wastewater Reuse Permit Renewal Application

1.0 PURPOSE

The purpose of this memorandum is to satisfy the requirements of IDAPA 58.01.17.700.04 (Wastewater Reclamation and Reuse Regulations) for issuing wastewater reuse permits. The memorandum states the principal facts and significant questions considered in preparing the draft permit conditions or the intent to deny, and a summary of the basis for approval or denial with references to applicable requirements and supporting materials.

2.0 PROCESS DESCRIPTION

The City of Mountain Home wastewater treatment facility is located at the south of the City. It consists of nine facultative lagoon cells, a chlorination facility and winter storage. The facility land applies at slow rate. Cell 6 has been taken offline since 2002 due to excessive seepage.

The currently permitted land application site (Field 1) consists of 260 acres of farm land which is managed in five hydraulic management units (HMUs). The site is private property owned by Anderson Property and leased by the City. The property is located south of the storage lagoons, in T04S R06E Sec 13, and is bounded on the north by Hamilton Road. Treated effluent is disinfected by chlorine and conveyed ½ mile by a 21-inch suction pipeline to the pump station. The disinfected effluent is land applied via hand lines. Supplemental irrigation water is used when the effluent is insufficient to meet crop water requirements. The existing permit allows land application during the growing season (April to October) only. On the currently permitted site, wheat, sugar beets and alfalfa are grown on the five HMUs.

The current system was planned for 119 gpcd (gallon per capita per day, 1997-2002 average daily flow rate). In 2005, 286 million gallon (MG) wastewater was treated and stored in the lagoons. A total of 248.8 MG was land applied to Field 1.

Two modifications are proposed in this renewal application package:

1. Increased land application areas. Two fields adjacent to the existing site (Field 1) are proposed as new land application sites. Field 2 consists of 140 acres located directly south of Field 1 (the Anderson property). Field 3, consisting of 80 acres owned by the City, is located directly west of field 1. The total proposed land application area in the renewal application is 480 acres.

2. Extended land application period. The existing permitted period is for the growing season only, from April 1 to October 31. The facility proposed a 60 day extension to the existing permit, from March 1 to November 30.

Solid wastes (sludge) generated in the treatment process are mostly digested in the lagoons due to the long detention times. A DEQ site inspection in August 2000 reported no odor for the lagoon system. A DEQ site visit on March 7th, 2007 found that sludge from the treatment lagoons had been deposited on the proposed Field 3 more than 15 years ago. No dredging has been conducted since then. Accumulated sludge is projected to be approximately 2 feet by 2015 in the lagoons. The sludge will be tested at that time and a waste solids management plan submitted for DEQ review and approval.

3.0 SUMMARY OF EVENTS

The first permit for the City of Mountain Home was issued on July 20, 1989. This permit expired on June 30, 1996. On November 27, 1995, the City requested an extension to submit its permit renewal application to prepare additional information. DEQ approved the extension.

The existing permit (LA-000037-02) was issued on December 19, 1996 and expired on December 16, 2001. The City requested an administrative extension of the permit on February 2004. DEQ approved the request. LA-000037-02 is in effect until a new permit is issued. Renewal application for LA-000037-02 was received by DEQ on December 21, 2006.

After the existing permit was issued, DEQ revised the serial number of hydraulic management unit MU-003704 to MU-003706 on January 6, 1997.

Five compliance activities (CA) were included in the existing permit (LA-000037-02). The facility completed: 1) A water balance study (seepage tests) of the treatment lagoon system (CA-037-01) was submitted by the facility and was approved by DEQ on March 23, 1998. Seepage tests were conducted on the lagoon system (except PVC lined cell 9) in 2003. Cells 5 and 6 exceeded the regulated permit rate of 0.25 inches/day. Cell 6 was taken off-line and Cell 5 is scheduled to be removed from service; 2) An updated plan of Operations and Maintenance (O&M) Manual (CA-037-05) on March 23, 1998; 3) A well Location Acceptability Analysis (CA-037-04) was submitted and approved on January 4, 1999 ; 4) A report of disinfection system performance or corrective action (CA-037-02) on April 13, 1999; and 5) A modified buffer zone in the permit based on total coliform limit (CA-037-03) was approved in May 1999. The permit listed a median total coliform limit of 23 colony forming units (CFU)/100 ml based on the last five samples as requirement and therefore, the minimum buffer zone between land application site and residences is 300 feet.

An inspection of the facility was conducted by DEQ Boise Regional office staff on August 3, 2000. Facility was found operating according to existing permit. A copy of the inspections report was sent to the City.

4.0 DISCUSSION

The following is a discussion of the plan of operation, hydraulic management unit configuration, Field 3 implementation plan, wastewater flows and constituent loading, ground water, and soils. Conclusions and recommendations are provided in Section 5 below.

4.1 PLAN OF OPERATION AND MANAGEMENT

The Plan of Operation and Management is a living document and is modified as operations and regulatory requirements change. In the renewal application, the City proposed two modifications of the existing permit, namely an increase to the land application site by 220 acres and an extended application period from March 1 to November 30. An updated Plan of O&M is required as compliance activity (CA-037-01) in the draft permit. The Plan is to be submitted for DEQ review and approval within the required timeframe. Please refer to Section E of the draft permit for details. The City is responsible for seeing that the Plan is implemented to fulfill permit conditions. Since Field 1 and Field 2 are privately owned and operated by contracted farmers, the City, land owner(s) and farmer(s)/operator(s) should establish understanding and agreement of permit conditions and to operate the land application according to the O&M Plan.

4.2 HYDRAULIC MANAGEMENT UNIT CONFIGURATION

Reclaimed wastewater is Class 'C' and is currently applied to the permitted 260 acres. The City of Mountain Home is proposing significant changes in regards to the amount of wastewater land treatment acreage and application period. The City is expecting increased population for the next ten years. In 2005, the population of Mountain Home was 11,565; by 2016 the population is projected to reach 20,500. An additional 220 acres divided into two fields (Field 2 and 3) directly south and west of existing site Field 1 (245 acres) are proposed for future use. The existing permit has five HMUs designated for Field 1. The Preliminary Technical Report for the renewal application does not provide HMUs for the new fields. DEQ recommends following designation for the land sites (both existing and proposed) in this renewal application in Table 1. The recommendation is mainly based on operation and management in the Fields.

Table 1. Designation of Hydraulic Management Units (HMU) of the Land Application Fields

HMU Number	Description	Acreage	soil
MU-003701	Field 1: NW section	35	Power
MU-003702	Field 1: North center	65	71% Colthorp-Kunaton 29% Power
MU-003703	Field 1: NE section	80	69% Colthorp-Kunaton 31% Power
MU-003705	Field 1: SW section	40	49% Colthorp-Kunaton 51% Power
MU-003706	Field 1: SE section	40	Colthorp-Kunaton
MU-003707	Field 2	140	Colthorp-Kunaton
MU-003708	Field 3: East section	40	Power
MU-003709	Field 3: West section	40	Colthorp-Kunaton
	Total	**480**	

4.3 IMPLEMENTATION PLAN OF FIELD 3

DEQ approved an emergency land application on Field 3 on March 19, 2007 to avoid failure of the storage lagoon. The Field will not be operated for land application (both GS and NGS) until an Implementation Plan for the Field is approved by DEQ. The plan should address the manner in which Field 3 will be prepared for land application and cropping operation. Recommended contents of the plan are at least (1) plans and specifications for the wastewater distribution system; (2) characterization of dredging or waste solids on site and the manner in which these solids will be disposed and managed; (3) runoff control practice for the drainage (intermittent Rattlesnake Creek) on site as required by Compliance Activity (CA-037-06) and permit condition in Section F. The Implementation Plan is listed as CA-037-05 in the draft permit.

4.4 WASTEWATER FLOWS AND CONSTITUENT LOADING RATES

4.4.1 Wastewater flows and hydraulic loading rate

The City of Mountain Home wastewater treatment plant currently handles 1.5 million gallon per day (MGD) average daily flow. Annual population growth rate is estimated at 7% (Keller Associates, 2006). By the end of the five-year proposed permit life in 2012, the projected population will be 17,850 and the average daily flow will be 2.12 MGD, which is approximately 2400 acre-feet of wastewater influent. Actual wastewater available for storage and land application is the sum of influent and precipitation minus the sum of evaporation and seepage. The average annual precipitation in the Mountain Home area is 10.6 (DEQ Guidance Section 4.4.4, 2006) inches and pond evaporation is 41.7 inches (Keller Associates, 2006).

Under the existing permit, the application season for the City of Mountain Home is from April 1 through October 31(214 days) under the existing permit. The City has requested a 60-day extension of the application in the non-growing season, from March 1 to 31 and November 1 to 30th. Growing season hydraulic application rates are based on crops irrigation water requirement (IWR). The amount of applied wastewater and supplemental irrigation water should be meet the IWR for a given crop. Non-growing season hydraulic application rates (HLR_{ngs})are based on available water capacity (AWC) of the soils. Equations 1 and 2 shows the calculations of growing season IWR and non-growing HLR_{ngs}:

$$IWR= [CU-(PPT_e+ \text{carry over soil moisture}) + LR]/E_i \quad \text{--- (1)}$$

Where,
IWR = the irrigation water requirement for the growing season
CU = the crop consumptive use
PPT_e = the effective precipitation and assumed 70% of the actual precipitation
LR = the leaching rate
E_i = the irrigation efficiency, 60-75% for hand lines and assumed 70% for the calculation

For permit purposes, the soil carry over moisture and leaching rate are assumed to be zero in calculating the IWR. Currently the City rotates the crops on Field 1. The renewal

application indicates that alfalfa hay is recommended for all sites due to its high water and nutrient uptakes. The consumptive use for alfalfa hay in Mountain Home is 966 mm or 38.0 inches (Kimberley R&E Station, University of Idaho, 1983). The average rainfall for the area during the growing season is 4.19 inches. Therefore, the IWR for alfalfa hay is approximately 50.1 inches. If alfalfa hay is the crop for the total 480 acres (*including* Field 3), this makes for a maximum wastewater application volume of 652 MG annually. The annual growing season wastewater amount is reduced to 544 MG *excluding* Field 3. Sugar beets and spring grain (wheat) have been used on the application sites. Both crops require less water to grow. The CU for sugar beets and wheat are 34.2 inches and 26.1 inches respectively. Therefore, their IWR is reduced to 44.7 and 33.1 inches respectively. The facility should monitor the total amount of wastewater applied to the sites according to its cropping operation and management. Growing Season Hydraulic Loading Rate shall be substantially equal to the IWR throughout the season.

For non-growing season hydraulic loading rates,

$$HLR_{ngs} = AWC + E - PPT_{ngs} \quad \text{--- (2)}$$

Where,
AWC = the soil's available water holding capacity, site-specifically calculated for a 60 inch soil depth or a root limiting layer, whichever is shallowest
E = non-growing season evaporation/evapotranspiration
PPT_{ngs} = the average precipitation during the non-growing season.

Variability of soils on a HMU generally means AWC values will vary as well. The National Resources Conservation Services (NRCS) soil survey map showed that there are two principal types of soils in the land application sites, the Colthorp-Kunaton series and the Power series. The Colthorp-Kunaton complex consists of silts and silt clay loam over a cemented hardpan. Soil depth is usually less than 20 inches. Colthorp-Kunaton soils occupy 75% of the land application site. Another 25% of the application site, mainly north of Field 1 and east of Field 3, is very deep Power silt loams (60 inches). The AWC of Power soils is very high and about thee times that of the Colthorp-Kunaton complex.

DEQ conducted soil sampling in MU-003706 during July 2006 and found soil is shallow at 6-18 inches along the east side of the HMU. NRCS soil survey showed that the soil depth is 15-18 inches. Reported AWC will be reduced if the actual soil is shallower. Soil profile study is recommended before non-growing season land application to estimated the allowable hydraulic loading rates for each HMU. Non-growing season hydraulic loading rate shall not exceed hydraulic capacity of the soils throughout the season. This is listed as compliance activity (CA-037-04) in the draft permit. AWC for each HMU can be calculated either using acreage-weighted average or using the more limiting Colthorp-Kunaton complex. Acreage percentage of each HMU is provided in Table 1.

4.4.2 Constituent Loading Rates

4.4.2.1 Wastewater Quality

Wastewater quality has been monitored by taking grab samples at the effluent pump before applying to the sites. Monitoring includes daily sampling for total coliform and residual chloride measurement, weekly for BOD and TSS measurements and monthly for TKN, COD, ammonia-nitrogen (NH_4-N), nitrate-nitrogen (NO_3-N), total phosphorus (TP) and TDS. Bacteria monitoring showed the facility is in compliance with the permit for Class "C" wastewater. Occasional total coliform counts were higher than 23 CFU/100 ml for a single sample in summer but still in compliance with the permit condition of less than 230 CFU/100ml for a single bacteria sample. The median for the measurements are within 23 CFU/100ml. Monitoring of residual chlorine is required under existing permit but has not been measured or reported. However, residual chlorine is not regulated for Class 'C' effluent for land application (IDAPA 58.01.17). Monitoring showed the following average characteristics of the effluent: COD 127 mg/l, TKN 11.8 mg/l, NH_4-N 3.6 mg/l, NO_3-N <0.6 mg/l, TP 3.4 mg/l and TDS 433 mg/l. These average strengths of the wastewater are used to estimate projected constituent loading rates (Table 2). The total nitrogen loading is higher than estimated by Keller Associates. This is because TKN and NO_3-N are all included when estimating the nitrogen loading from the wastewater while Keller Associates used only TKN. The annual loading rate is the sum of both GS and NGS loadings.

Table 2. Projected constituent loading rates from wastewater land application.

Constituents	Growing-Season (GS)				Non-Growing Season (NGS)
Hydraulic (inches)	35	40	45	50	2.7
Hydraulic (MG on 480 acres)	456	521	586	652	46.8
COD, lb/acre-day	4.7	5.4	6.0	6.7	1.7
Nitrogen, lb/acre	98.3	112.3	126.3	140.4	10.1
Phosphorus, lb/acre	26.9	30.8	34.6	38.5	2.76
TDS, lb/acre	3432	3922	4412	4902	352

Wastewater quality monitoring proposed by the draft permit includes the following:

Table 3. Wastewater quality monitoring parameters

Parameters	Description	Frequency
Total Coliform, Chlorine Residual	Grab Sample	weekly (when land applying)
COD, TKN, Ammonia-N, Nitrate-N, Total P, Total Dissolved Solids, Volatile Dissolved Soilds	Grab Sample	Monthly (when land applying)

4.4.2.2 Nitrogen Management and Loading Rates

Typical nitrogen uptake for alfalfa hay is 200-300 lb/acre (Keller Associates, 2006). Nitrogen loading from the wastewater is below the crop uptake value. According to annual report information, commercial fertilizer has been used on the currently permitted Field 1 to meet the nutrient requirements of the crops. The land application site is within

the Mountain Home Nitrate Priority area. The current groundwater monitoring network does not provide adequate information to evaluate the site impacts on local groundwater.

Field 1 is privately owned and leased to the City. The owner has an agreement with a farmer for land application (both wastewater and fertilizers). Detailed commercial fertilizer application information is not available for Field 1. One private drinking water well adjacent to the existing site has groundwater nitrogen concentrations exceeding the GWQR (IDAPA 58.01.11.200.01a) of 10 mg/l. DEQ is continuing the groundwater evaluation in this area to determine if land application site impacts exists for the downgradient groundwater (Baldwin, 2007).

Soil nitrogen and soil phosphorus information were collected during November 2006 and provided to DEQ by the facility. The results, listed in Appendix 4 show that carryover nitrogen ranges from about 90 to about 370 pounds per acre for the 0-36' soil depth. A general rule for thumb for wheat production is two pounds of nitrogen per bushel of grain (University of Idaho Fertilizer Guide CIS No. 373). The 2006 Elmore County average for wheat was 95.5 bushels per acre, so the crop nitrogen requirement would be about 190 pounds of nitrogen per acre.

The draft permit includes nitrogen loading rate limit of 150% of typical crop uptake. The compliance activities included in the permit must be carried out during land application. All parties involved in the operation (the City, the land owner and the farmer/operator) should agree to the permit conditions and operate, maintain and manage the sites accordingly. DEQ recommends the facility establish operational control for the sites before and during the land application. DEQ also recommends an estimation of nitrogen balance during the operation. Crop tissue analysis at each harvest is required in the draft permit.

4.4.2.3 Phosphorus Loading Rates

Phosphorus loading rates are typically set by DEQ based upon either groundwater or surface water concerns. Phosphorus below the root zone is unavailable for crops and may breakthrough to ground water and be transported. Leached phosphorus can enter the surface water at surface water and groundwater interconnection(s). Additionally, phosphorus bound to topsoil is subjective to surface water contamination during runoff and soil erosion.

Phosphorus uptake for hay is 25-30 lb/ac (Keller Associates, 2006). Soil analysis on November 15, 2006 (Keller Associates, Table 4) showed that 1) phosphorus level in the top 3 feet of soils for the non-farmed but proposed Field 3 ranges from 152 to 213 pounds per acre. Field 2 has been farmed but not land applied. Phosphorus amount in Field 2 ranged from 250 to about 340 pounds per acre in the top 3 feet of soils. In Field 1, which is the currently used land application site, the phosphorus loads in the top 3 feet ranged from about 310 to about 575 pounds per acre, with the lowest soil phosphorus at the southeast corner of the field (308 pounds per acre) and the highest in the center east section of the field (575 pounds per acre). The nearest surface water for the facility is

Rattlesnake Creek at the west edge of Field 1 and in Field 3. The creek is intermittent with most of the years dry. The Guidance (Section 4.2.2.7) recommends that facilities should control phosphorus contamination to surface water during land application operation. The draft permit for this facility includes runoff control as one compliance activity and permit condition.

4.4.2.4 Total Dissolved Solids (TDS) Loading Rates

Secondary standard of GWQR (IDAPA 58.01.11.200.01b) for TDS in groundwater is 500 mg/L. Semiannual groundwater samples from MW-003702 have shown exceedance of the standard for 2005 and 2006 (Annual Report, Keller Associates, 2005 and 2006). This can be an indication of lagoon impact to the groundwater. Evaluation of site TDS impact on downgradient groundwater has not been done. Currently the facility does not have an adequate monitoring network. A groundwater monitoring network plan is one compliance activity (CA-037-03) in the draft permit.

TDS measured in ground water are commonly inorganic constituents (salts) while TDS in wastewater can include significant quantities of organic constituents in addition to salts. The salts in wastewater can be roughly estimated by non-volatile dissolved solids (NVDS), which is the difference between TDS and volatile dissolved solids (VDS). DEQ recommends that both TDS and VDS be monitored monthly during land application. The results are useful for modeling purposes.

4.4.2.5 COD Loading Rates

Wastewater reuse permits typically include a chemical oxygen demand (COD) permit loading rate limit of 50 pounds/acre-day during the growing season and 25 pounds/acre-day during the non-growing season. These limits are retained for this draft permit. The estimated COD loading rate from the wastewater (Table 2) is far below the proposed limits.

4.5 ENVIRONMENTAL ISSUES

Issues related to ground water, surface water, buffer zones and nuisance odor regarding the sites are discussed below.

4.5.1 Ground Water

Ground water in the area of the wastewater reuse site occurs in a shallow perched aquifer and a deep regional aquifer. The perched aquifer extends from north of Mountain Home to the vicinity of the City's treatment lagoons and has an east-west extent of about two miles. The perched aquifer is composed of sand and gravel in the northern area and fine sands and silty sands around the wastewater treatment lagoons. The depth to water in the perched aquifer varies from greater than 25 feet below land surface north of Mountain Home to about six feet below land surface at the southern end of the wastewater treatment lagoons. The direction of movement in the perched aquifer is believed to be to the south-southwest at the wastewater reuse site. The perched aquifer probably is

recharged by irrigation canal seepage north of Mountain Home and lagoon seepage in the vicinity of the treatment lagoons.

Two cells in the lagoon system do not meet the seepage requirement. Cell 6 was abandoned about two years ago and cell 5 disconnected from the treatment system. Both cells are under rehabilitation in this summer. The two cells will be deepened, lined and combined as one storage pond. Although the other six lagoons currently meet the DEQ seepage requirements of 1/8 inch per day (IDAPA 58.01.16, section 493.03), seepage tests in 2002 and 2003 showed that about 312 acre-feet (excluding Cell 5 and 6, Keller Associates, 2004) or equivalently 102,000,000 gallons wastewater was leached to the groundwater each year.

In the regional aquifer, ground water occurs in fractures, flow tops and cinder units found in the regionally extensive basalt flows beneath the Mountain Home area. The depth to water in the regional aquifer is 300-400 feet below land surface. Groundwater flows to the south and south west in the regional aquifer. Beneficial uses of this groundwater include irrigation and drinking water uses.

4.5.1.1 Monitoring Well Network

The land application site lies within the Mountain Home nitrate priority area. Information about nitrate priority areas in the state can be found at the following link: http://www.deq.idaho.gov/water/prog_issues/ground_water/nitrate.cfm. Five monitoring wells are included in the existing permit. All five wells were intended to monitor the perched aquifer and are completed to depths of about 25 to 30 feet below the land surface. GW-003701 is an up gradient well located north of the treatment lagoons, and GW-003702 and GW-003703 are located south of the storage lagoons (cells 8 and 9) and north of the current land application site Field 1. GW-003704 and GW-003705 are downgradient wells located south of Field 1. The up gradient well GW-003701 and the two down gradient wells GW-003704 and GW-003705 have been dry for years and no monitoring data exists for these three wells.

GW003702 and GW003703 monitor the effluent from storage lagoons but not the impact of wastewater applications at the land application acreage. A groundwater monitoring network plan is necessary for the site and listed as one compliance activity (CA-037-03) in the draft permit (Section E.). The plan should be submitted to DEQ for review and approval. Appropriateness of domestic wells in the vicinity should be analyzed before using them as site monitor wells.

One private water supply well downgradient of Field 1 has shown elevated N concentration that exceeds the GWQR 10 mg/l criterion (IDAPA 58.01.11.200.01a). DEQ has an on-going study on the N issue in this area. Submittal of actual fertilizer application records from the farmer is listed as one monitoring parameter in the draft permit.

4.5.2 Surface Water

The nearest surface water is Rattlesnake Creek, located less than 50 feet from the west edge of existing Field 1. West Side Canal is located more than 450 feet east of Field 1. Rattlesnake Creek is intermittent with most of the years dry. The facility should operate the sites with no effluent discharge to surface water occurring. A runoff management plan is included as one compliance activity (CA-037-05) in the draft permit.

4.5.3 Buffer Zones

In order for the facility to be in compliance with the established requirements (IDAPA 58.01.17.600.07 (b)) for Class 'C' wastewater the following buffer zone requirements is recommended during land application:

- 1000 feet from reuse site and public water supply wells
- 500 feet from reuse site and private potable supply wells
- 300 feet from reuse site and inhabited dwellings
- 100 feet from reuse site and permanent or intermittent surface water (including drainage creeks discussed in Section 4.4.2)
- 50 feet from reuse site and irrigation ditches/canals
- 50 feet from reuse site and areas of public access

4.5.4 Lagoons

The City of Mountain Home uses lagoons as the primary wastewater treatment and storage facility. Cell 6 was abandoned due to high seepage rate. Raising of the dikes for a few cells have been proposed by the permittee (Keller Associates, 2004) to accommodate increased population and the resulting increase in wastewater flow. Also, a membrane liner is proposed for the cells that currently have a clay liner. In the draft permit, DEQ recommends (1) perform seepage test in accordance with compliance activities (Ca-037-02) for each cell; (2) operate and manage the system to consider peak flows and extreme weather conditions to avoid overtopping/runoff of the lagoons.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Compliance Activities (CA) are numbered as they appear in the draft permit.

DEQ recommends the following designation of HMUs for the extended land application acreages: MU-003707 for Field 2, MU-003708 for Field 3 East section and MU-003709 for Field 3 West section. This designation is based mainly on soil properties and operation and management practices (current and future) at the sites. Growing season wastewater hydraulic loading should be substantially equal to IWR of the crops on the sites. The non-growing season application rate should not exceed soil water holding capacity.

Soil monitoring is added in this draft renewal permit although not required in existing permit. Refer to Section G of the draft permit for soil monitoring details.

DEQ recommends the City monitor nitrogen balance and establish operational control with involved land owner and farmer(s) during the land application period. Crop tissue analysis is required at each harvest and must be submitted to DEQ for review in annual report.

The land application operator(s) should be certified as specified in the draft permit Section F. Please contact Carol Garrison at DEQ at 373-0406 for details of the certification.

An updated O&M manual should be submitted to DEQ for review and approval (CA-037-01). Besides the content of existing Plan of Operation, the manual should also include O&M on extended fields (Field 2 and 3), the non-growing season application, emergency plan, solids waste management plan.

Lagoon seepage tests are recommended for all lagoons currently in use and which will be used in the new permit life cycle (CA-037-02).

DEQ recommends the City submit a plan of groundwater monitoring (CA-037-03) including at least: (1) an evaluation of the current groundwater monitoring network; (2) groundwater monitoring network plan and implementation during the new permit cycle. The reports should be prepared by a registered professional geologist (PG) and submitted for DEQ review and approval.

Soil profile study for the sites is recommended. The study should be completed and approved by DEQ before non-growing land application on the sites (CA-037-04)

Despite the March 2007 emergency application on Field 3 to avoid lagoon system failure, an implementation plan should submit for DEQ's review and approval before land application, both growing season and non-growing season on the Field (CA-037-05).

A runoff control plan is required during the operation (CA-037-06).

6.0 REFERENCES CITED

[1] Department of Environmental Quality (DEQ), 2006. Handbook for Land Application of Municipal and Industrial Wastewater.

[2] Keller Associates, 2006. Preliminary Technical Report for Reuse Permit Application for Wastewater Land Application – Mountain Home, Idaho.

[3] Keller Associates, 2004. Sewer Facility Planning Study – City of Mountain Home, Idaho.

[4] University of Idaho Fertilizer Guide Current Information Series No. 372, B.D. Brown and D.T. Westerman.

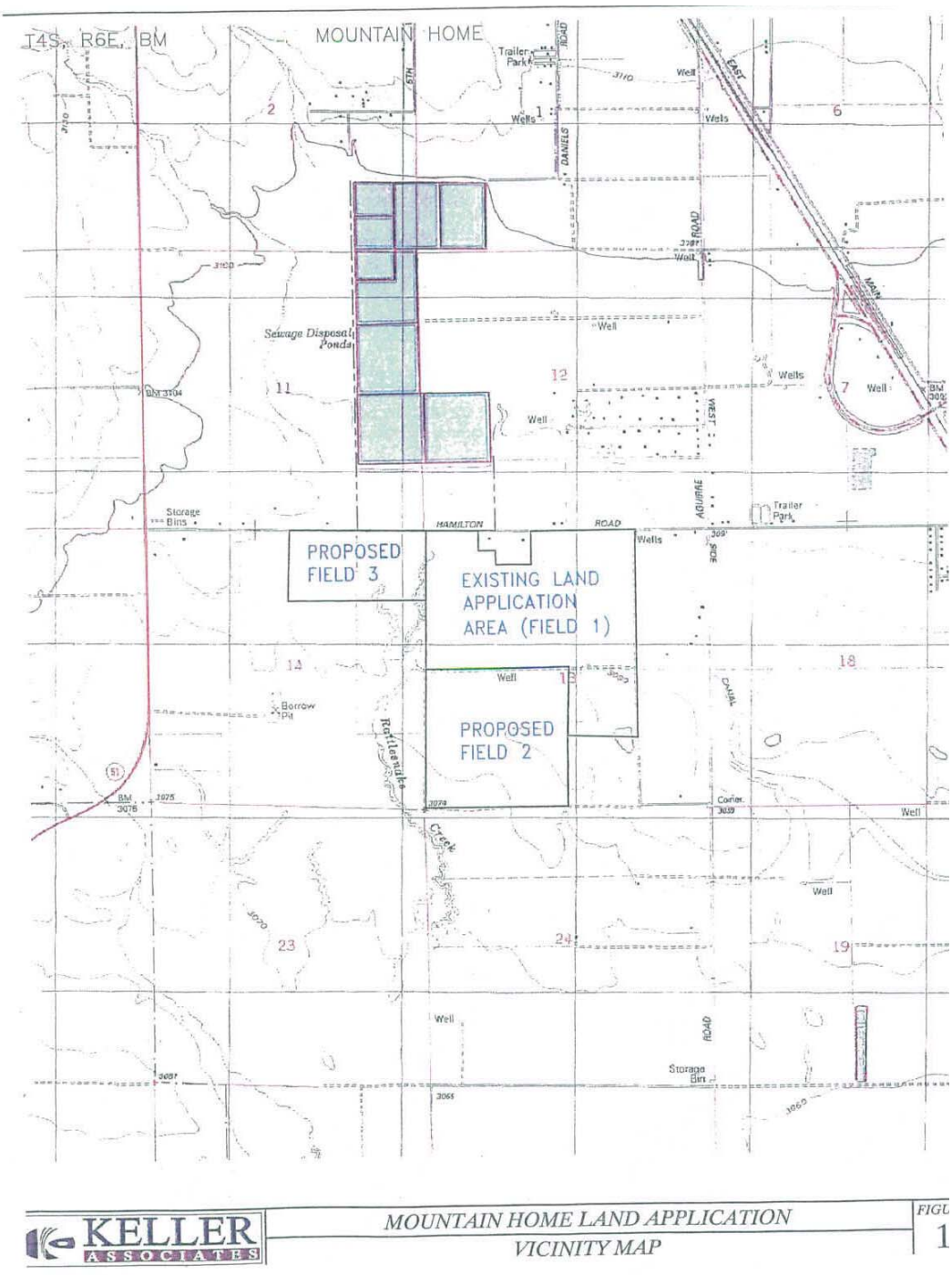
[5] Kimberley R&E Center, University of Idaho, 1983. Estimating Consumptive Irrigation Requirements for Crops in Idaho.

[6] Baldwin J. 2007. South 18th Street Ground Water Investigation. Department of Environmental Quality (DEQ).

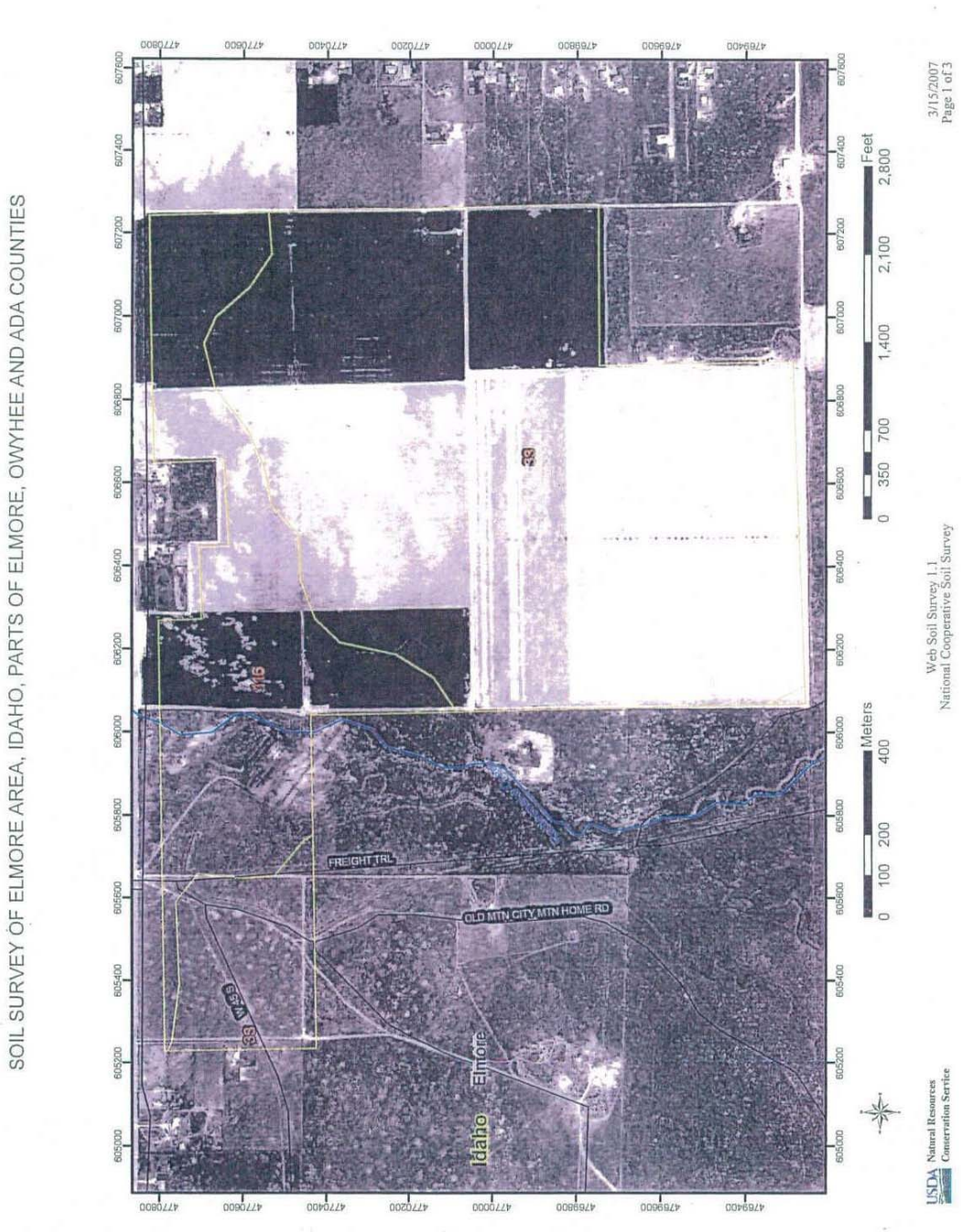
Appendix 1: site map – general location and vicinity
Appendix 2: site map – soil survey map
Appendix 3: site map – wells in vicinity
Appendix 4: Soil test nitrogen and phosphorus data in November 2006

cc: WLAP Source File no. LA-000037-03
Mark Mason, P.E., Engineering Manager, Boise Regional Office

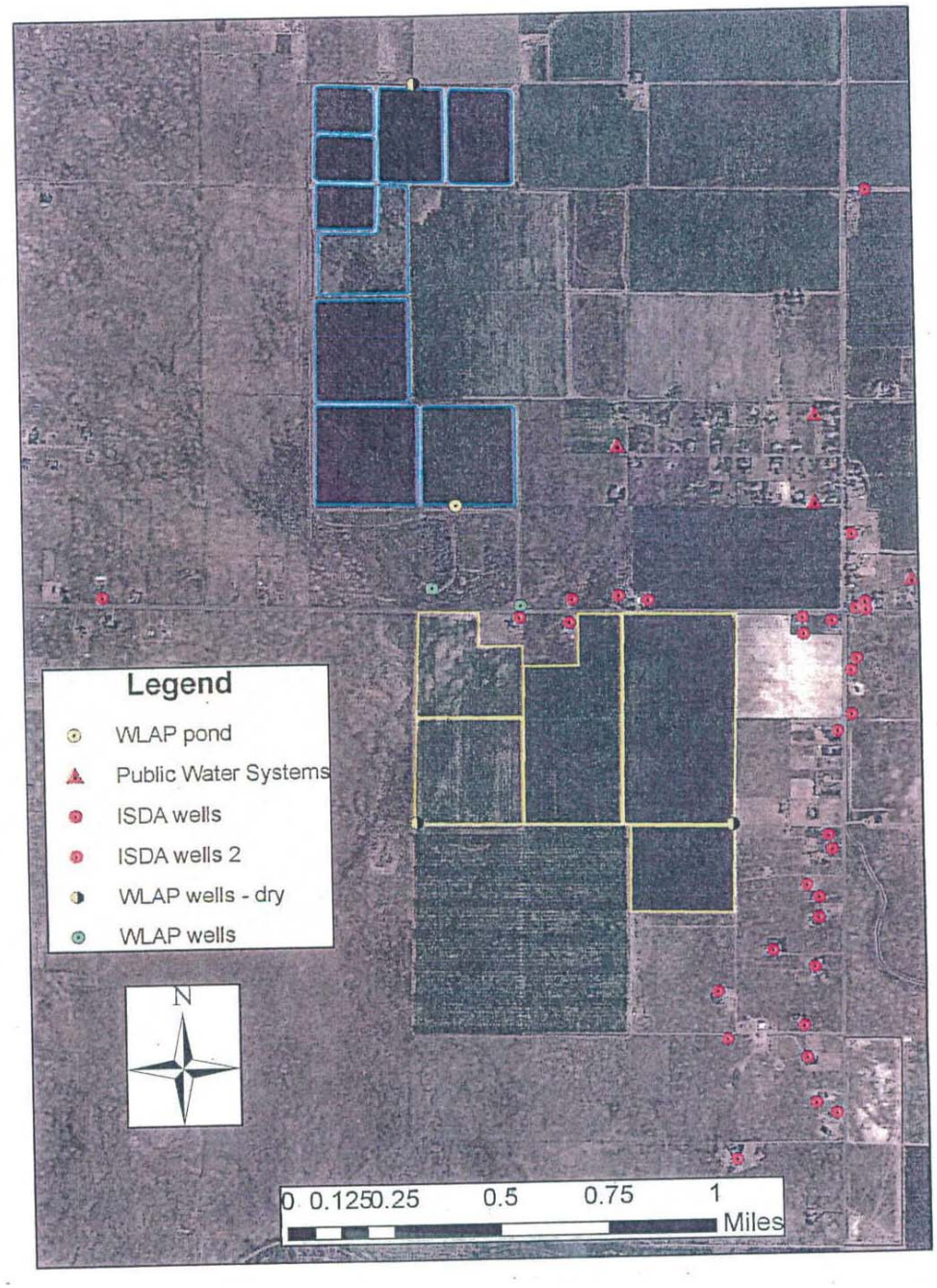
Appendix 1 Site Map – General Location and Vicinity



Appendix 2: Site Map – Soil Survey Map



Appendix 3: Site Map – Wells in Vicinity Map



Appendix 4: Soil Test Nitrogen and Phosphorus Data

Sample Location	NO2+NO3 mg/kg	NH3 mg/kg	P mg/kg	NO2+NO3 lbs/ac-ft	NH3 lbs/ac-ft	Total N lbs/ac-ft	P lbs/ac
Field 1 - existing WLAP site	16	5.5	43.8	64	22	86	175.2
	21	5.7	28.2	84	22.8	106.8	112.8
	6	6.5	18.1	24	26	50	72.4
						242.8	**360.4**
Field 1 SE2	36	4.8	56.3	144	19.2	163.2	225.2
	12	4.4	7.4	48	17.6	65.6	29.6
	7.5	6.2	13.4	30	24.8	54.8	53.6
						283.6	**308.4**
Field 1 CE2	20	5.5	89.1	80	22	102	356.4
	28	6.1	31.9	112	24.4	136.4	127.6
	28	4.6	22.6	112	18.4	130.4	90.4
						368.8	**574.4**
Field 1 NE2	15	6.2	58.4	60	24.8	84.8	233.6
	7.5	6	39.4	30	24	54	157.6
	6.7	7.1	10.5	26.8	28.4	55.2	42
						194	**433.2**
Field 2 proposed	5.4	4.5	44.2	21.6	18	39.6	176.8
	4.8	6.6	32.9	19.2	26.4	45.6	131.6
	4.4	9.2	7.6	17.6	36.8	54.4	30.4
						139.6	**338.8**
Field 2S proposed	33	5.8	30.5	132	23.2	155.2	122
	13	5.3	20.1	52	21.2	73.2	80.4
	8.9	5.9	11.9	35.6	23.6	59.2	47.6
						287.6	**250**
Field 3 proposed	8.4	5.2	27.9	33.6	20.8	54.4	111.6
	6.3	4.7	13.7	25.2	18.8	44	54.8
	6.9	6.5	11.7	27.6	26	53.6	46.8
						152	**213.2**
Field 3W proposed	5.5	3.1	18.2	22	12.4	34.4	72.8
	5.2	2.2	9.8	20.8	8.8	29.6	39.2
	4.2	2.2	10	16.8	8.8	25.6	40
						89.6	**152**

Notes: 1. Samples collected in November 2006 by Keller Associates.
2. Analysis performed by Analytical Labs, Boise. Results submitted to facility.
3. Three depths of the soil samples are 0-12", 12-24" and 24-36"